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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 6,783,120 B2

Issued: 08/31/2004

Inventor(s): Shakur et al.

Title: MULTIPLE DOWNCOMER FRACTIONAL DISTILLATION TRAY AND PROCESS

69973393

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE (37 CFR 1.322(a))

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Certificate  
SEP 15 2004  
of Correction

Sir:

The above-designated patent issued with the following errors.

**In claim 2:** In column 11, line 6, "pen" should be replaced with "pan."

In accord with the requirements of the "Expedited Issuance of Certificates of Correction When the Error is Attributable to the United States Patent and Trademark Office" (Official Gazette, September 17, 2002), Patentee encloses a copy of the Amendment dated March 11, 2004, in which the subject claim appears correctly.

It is believed that the enclosed documentation unequivocally supports Patentee's assertion that the error incurred through the fault of the PTO. Therefore, the requirements for expedited issuance of the Certificate of Correction are met.

Attached is Form PTO-1050. It is believed that no fee is required.

Respectfully submitted,

UOP LLC

David J. Piasecki, Agent for Applicant

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DJP:sb

SEP 16 2004

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO.: 6,783,120 B2

DATED: 08/31/2004

INVENTORS: Shakur et al.

**It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:**

The above-designated patent issued with the following errors:

In claim 2: In column 11, line 6, "pen" should be replaced with "pan."

MAILING ADDRESS OF SENDER:

JOHN G. TOLOMEI  
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PATENT NO. 6,783,120 B2

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**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO.: 6,783,120 B2  
DATED: 08/31/2004  
INVENTORS: Shakur et al.

**It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:**

The above-designated patent issued with the following errors:

In claim 2: In column 11, line 6, "pen" should be replaced with "pan."

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SEP 16 2004



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<b>TRANSMITTAL FORM</b> <small>(to be used for all correspondence after initial filing)</small>	Application Number	09/973,393
	Filing Date	10/09/2001
	First Named Inventor	Mohamed S.M. Shakur
	AI Unit	1724
	Examiner Name	Charles S. Bushey
	Attorney/Agent Number	106280

Total Number of Pages in This Submission: 11

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**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm or Individual name: David J. Plasecki  
 Signature: *[Signature]*  
 Date: March 11, 2004

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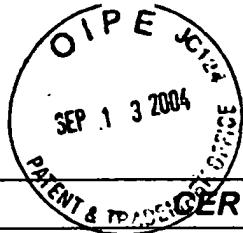
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Signature		Date	March 11, 2004

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	
	)	Attorney Docket No.: 106290
Mohamed S. M. Shakur, et al.	)	
	)	Examiner: Charles S. Bushey
Application No: 09/973,393	)	
	)	Group Art Unit: 1724
Filed: October 9, 2001	)	
	)	Confirmation No.: 6135
MULTIPLE DOWNCOMER	)	
FRACTIONAL DISTILLATION	)	
TRAY AND PROCESS	)	

**AMENDMENT UNDER 37 CFR §1.116**

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Commissioner for Patents  
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Sir:

In response to the Office Action of January 14, 2004, please amend the above identified application as follows:

Amendments to the claims are reflected in the listing of claims beginning on page 2 of this paper.

Remarks begin on page 7 of this paper.

### Amendments to the Claims

Please amend the claims in the subject application as reflected in the following listing.

1. (Previously Presented): A fractional distillation process which comprises:

(a) passing a liquid comprising a first component and a second component onto an upper first tray located in a fractional distillation column containing a plurality of vertically spaced apart fractionation trays operated at fractionation conditions which cause vapor to rise through decking areas provided on the trays while liquid is collected in at least one downcomer portion of each tray, the liquid collected in the downcomer of the first tray exiting the downcomer through openings located in a lower portion of the downcomer;

(b) intercepting liquid, which is passing downward from said openings in the lower portion of the downcomer of the first tray, on a central portion of an antipenetration pan located under said openings and between the first tray and a lower, second tray, the antipenetration pan comprising two arms extending away from the central portion and ending at points located at least one-half the width of the central portion away from said central portion;

(c) discharging a first portion of the liquid which is intercepted by the central portion of the antipenetration pan onto the decking area of the second tray from each of the two arms of the antipenetration pan; and

(d) passing a second portion of the liquid which is intercepted by the antipenetration pan downward through openings in the central portion of the antipenetration pan.

2. (Cancelled)

3. (Previously Presented): The process of claim 1 further characterized in that liquid is discharged from the arms of the antipenetration pan in a direction substantially parallel to a downcomer of the second tray.

4. (Previously Presented): The process of claim 1 further characterized in that the central portion and each of the two arms of the antipenetration pan are rectangular.

5. (Original): A fractional distillation process which comprises:

(a) passing a liquid comprising a first volatile compound and a second volatile compound downward through a fractional distillation column containing a plurality of vertically spaced apart multiple downcomer fractionation trays and operated at fractionation conditions which cause vapor to rise through decking areas provided on the trays while liquid is collected in a trough-shaped downcomer present on each tray, with liquid which has been collected in said downcomer exiting the downcomer through grouped openings located in a lower portion of the downcomer;

(b) discharging descending liquid from the openings in the lower portion of the downcomer of the upper first tray upon a plurality of antipenetration pans located between the first tray and a lower second tray, with the antipenetration pans comprising a central portion located under the grouped openings of the downcomer of the first tray; and

(c) discharging liquid from the central portion of the antipenetration pans onto the decking area of the second tray and also discharging liquid onto the decking of the second tray from each of two arms which extend outward from the central portion of the antipenetration pan in directions parallel to a downcomer of the second tray.

6. (Previously Presented): The process of claim 5 further characterized in that the number of antipenetration pans per tray is greater than the number of downcomers per tray.

7. (Previously Presented): The process of claim 5 further characterized in that the downcomers of the second tray are substantially perpendicular to the downcomers of the first tray.

8. (Previously Presented): The process of claim 5 further characterized in that at least one-third of the liquid which is discharged upon an antipenetration pan from the upper first tray is in turn discharged from the antipenetration pan via the two arms of the antipenetration pan.

9 -12 (Cancelled)

13. (Original): An apparatus for performing fractional distillation in a fractionation column, which apparatus comprises:

(a) an upper first tray and a lower second tray, with both the first and second trays comprising at least two trough-shaped downcomers and at least one elongated vapor-liquid decking area located between the downcomers, and with the downcomers of the first tray being oriented differently than the downcomers of the second tray, with the downcomers of each tray having at least two groups of spaced apart liquid outlets in the bottom of the downcomers; and,

(b) at least two antipenetration pans mounted between the bottom of the downcomers of the first tray and the top of the vapor-liquid decking area of the second tray, with one antipenetration pan being located under each of the groups of liquid outlets in the first tray, the antipenetration pans comprising a perforated horizontal first platform having a major axis perpendicular to the downcomers of the second tray and an overlying generally U-shaped second platform attached to the first platform, the second platform having a major axis parallel to the downcomers of the second tray and ends located beyond the first platform.

14. (Original): The apparatus of claim 13 further characterized in that the first platform has raised end pieces parallel to the downcomers of the second tray.

15. (Original): The apparatus of claim 14 further characterized in that the length of the second platform is equal to 100 to 200% of the length of the first platform.

16. (Currently Amended): An apparatus for performing fractional distillation in a fractionation column, the apparatus comprising:

(a) an upper first tray and a lower second tray, with both the first and second trays comprising at least one elongated downcomer and two vapor-liquid decking areas adjacent the downcomer, the downcomer of the first tray having at least one group of liquid outlets in the bottom of the downcomer;

(b) an antipenetration pan being mounted at an intermediate level between the downcomer of the first tray and the decking areas of the second tray, the antipenetration



pan comprising a perforated, planar, central portion and at least two substantially planar extensions, wherein the central portion of the antipenetration pan being substantially parallel to the decking areas of the second tray is located under the group of liquid outlets of the downcomer of the first tray, and the substantially planar extensions projecting outward from the central portion of the antipenetration pan over and substantially parallel to areas of the decking of the second tray which are not under a group of liquid outlets.

17-18. (Cancelled):

19. (Previously Presented): The apparatus of claim 16 wherein the downcomer of the first tray being oriented transverse to the downcomer of the second tray.

20. (Previously Presented): The apparatus of claim 16 further comprising a plurality of liquid outlets and a plurality of antipenetration pans, there being no more than one antipenetration pan located under a group of liquid outlets and no more than one group of liquid outlets above an antipenetration pan.

21. (Previously Presented): The apparatus of claim 16 further comprising a raised end piece extending upwardly from an edge of the antipenetration pan.

22. (Previously Presented): The apparatus of claim 16 further comprising a baffle extending upwardly from the central portion of the antipenetration pan.

23. (Previously Presented): The apparatus of claim 16 wherein the extensions are aligned parallel to the downcomer of the second tray.

24. (New): An apparatus for performing fractional distillation in a fractionation column, the apparatus comprising:

(a) an upper first tray and a lower second tray, with both the first and second trays comprising at least one elongated downcomer and two vapor-liquid decking areas adjacent the downcomer, the downcomer of the first tray having at least one group of liquid outlets in the bottom of the downcomer;

(b) an antipenetration pan being mounted at an intermediate level between the downcomer of the first tray and the decking areas of the second tray, the antipenetration

pan comprising a perforated, planar, central portion and at least two, perforated, substantially planar extensions, wherein the central portion of the antipenetration pan being substantially parallel to the decking areas of the second tray is located under the group of liquid outlets of the downcomer of the first tray, and the substantially planar extensions projecting outward from the central portion of the antipenetration pan over areas of the decking of the second tray which are not under a group of liquid outlets.

## REMARKS

Favorable reconsideration of the pending claims is requested in view of the above amendments and following remarks. Applicants have amended claim 16 by incorporating claim 18 and present new claim 24 which contains all of the limitations of claims 16 and 17. Claims 17 and 18 are cancelled. No new matter has been added.

Claims 16, 19-21, and 23 stand rejected under 35 USC §102(e) as being anticipated by U.S. Patent 6,568,663 (Xu et al.). The Office Action also states that claims 17, 18, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants have amended claim 16 by adding the phrase, "and substantially parallel to", as shown in the claim listing to incorporate claim 18. Applicants respectfully assert this amendment puts the subject matter of claim 18 in condition for allowance in accord with the Office Action. Hence, Applicants respectfully assert that the rejections of claim 16 and claims 19-23, which depend from claim 16, are rendered moot. Applicants courteously request withdrawal of the rejections of claims 16 and 19-23 under 35 USC §102(e) as being anticipated by Xu et al.

Applicants present new independent claim 24 which is claim 17 rewritten to also include all the limitations of claim 16. Applicants respectfully assert new claim 24 puts this subject matter in condition for allowance in accord with the Office Action.

Applicants acknowledge the Examiner's allowance of claims 1, 3-8, and 13-15. Applicants courteously request entry of the amendments presented above and reconsideration and allowance of all claims 1, 3-8, 13-16, and 19-24 pending in the subject application in view of the amendments and remarks presented herein.

It is recognized that with these amendments the number of independent claims in the subject application exceeds the number of independent claims previously paid for by one. Therefore, Fee Transmittal and Credit Card Forms to pay the fee for the one additional independent claim accompany this amendment.

This submission is intended to be a complete response to all grounds of rejection and objection raised in the Office Action. If any grounds for rejection remain after consideration of this response, the Examiner is invited to call the undersigned.

Respectfully submitted,

UOP LLC



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